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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/054,150 | 01/21/2002 | Robert J. Smith | 1604-316-CIP | 6180 |
| 22442 | 7590 | 08/24/2005 | EXAMINER | |
| SHERIDAN ROSS PC 1560 BROADWAY SUITE 1200 DENVER, CO 80202 | | | BELLO, AGUSTIN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2633 | |

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

13

Office Action Summary

Application No.

10/054,150

Applicant(s)

SMITH, ROBERT J.

Examiner

Agustin Bello

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 90-126 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 90-126 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/11/05 3/19/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 90-100 and 109-126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (U.S. Patent No. 5,757,523) in view of Schwemmer (U.S. Patent No. 5,255,065).

Regarding claim 90, 109, 117, 120, Wood teaches transmitting at least one signal including first and second data from a transmitter (Figure 7) through atmospheric turbulence to a receiver (e.g. homes in Figures 4-6), wherein the receiver is located at a distance from the transmitter, wherein the at least one signal, after transmission through the atmospheric turbulence, has a distorted wavefront (inherent), and wherein each of said first and second data is associated with first and second wavelength channels (reference numerals 29a-29c in Figure 7), respectively, the first wavelength channel being different from the second wavelength channel. Wood differs from the claimed invention in that Wood fails to specifically teach transmission of data at a rate greater than one gigabit/second. However, Official Notice is given that transmission of data at a rate greater than one gigabit/second. Wood further differs from the claimed invention in that Wood fails to specifically teach receiving said at least one distorted signal including said first and second data at a detector assembly; detecting said first data using a first detector unit of the detector assembly, wherein the first detector unit is located at a first position; and detecting said second data using a second detector unit of the detector assembly,

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wherein the second detector unit is located at a second position that is different from said first position. However, Wood at minimum suggests that a detector assembly exists at the homes to receive the transmitted beam of the transmitter shown in Figure 7. Furthermore, Schwemmer, in the same field of optical communication, teaches a detector assembly for receiving said at least one distorted signal including said first and second data at a detector assembly (as seen in Figure 4); detecting said first data using a first detector unit of the detector assembly (reference numeral 31 in Figure 4), wherein the first detector unit is located at a first position; and detecting said second data using a second detector unit of the detector assembly (reference numeral 30 in Figure 4), wherein the second detector unit is located at a second position that is different from said first position. One skilled in the art would have been motivated to employ a detector assembly such as that taught by Schwemmer in order to separate different wavelengths along a common optical axis (column 4 lines 1-5 of Schwemmer). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a detector assembly such as that taught by Schwemmer as the detector device in the homes of Wood.

Regarding claim 91, the combination of Wood and Schwemmer teaches that said detecting first data step includes detecting at the same time, using said first detector unit, all of said first data that was received by said first position of said detector assembly at a particular instance in time (see Figure 4 of Schwemmer).

Regarding claim 92, 110, 121, the combination of Wood and Schwemmer teaches that said detecting first data step includes accepting a large focal spot size diameter and then reducing said focal spot size diameter. The combination of references differs from the claimed invention in that it fails to specifically teach that the accepted focal spot diameter size is greater than 40

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microns. However, focal spot diameters greater than 40 microns are not uncommon in the field of free space optical communication and in fact are well known in the art. One skilled in the art would clearly have recognized that the device of Schwemmer clearly illustrates that the focusing element of Schwemmer is capable of reducing the spot size of a received signal. It would have been well within the realm of knowledge of one skilled in the art to have applied the teachings of Schwemmer, and therefore the teachings of the combination of references, to an optical signal that produced a focal spot size with a diameter greater than 40 microns for the express purpose of reducing the focal spot size of that received signal. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the teachings of Schwemmer to an optical signal that produced a spot size diameter greater than 40 microns in order to reduce the spot size of the signal.

Regarding claims 93, 94, 111, 112, and 119, the combination of references teaches Official Notice is given that focusing elements having a refractive index greater than 2 and focusing elements having a traverse length along and through which said first data having said associated first wavelength passes, wherein the speed of said first data in passing along and through said traverse length is no greater than 30% of the speed of light in air are well known in the art.

Claims 95 and 113 recite limitations similar to those of claim 92. Therefore, claims 95 and 113 are rejected for the same reasons as those stated regarding claim 3 above.

Regarding claims 96, 114, the combination of references teaches that said detector assembly includes a linking device (reference numerals 26-28 in Figure 4 of Schwemmer), a

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focusing element (reference numeral 1 in Figure 4 of Schwemmer), and a detector unit (reference numerals 32-34 in Figure 4 of Schwemmer).

Regarding claims 97, 115, 118, the combination of references teaches focusing said first data with a holographic unit (reference numeral 1 in Figure 4 of Schwemmer).

Regarding claims 98, 116, the combination of references teaches that said detecting first data step includes reflecting said first data associated with said first wavelength by a first mirror (reference numeral 42 in Figure 5 of Schwemmer) to a focusing element (reference numeral 40 in Figure 5 of Schwemmer) and with an output of said focusing element being in communication with said first detector unit (see Figure 4 of Schwemmer).

Regarding claim 99, the combination of references teaches that wherein in said receiving step said first data is finitely focused on a first focal point and said second data is finitely focused on a second focal point and the first points is at least substantially at the first location and the second focal point is at least substantially at the second location (as seen in Figure 4 of Schwemmer).

Regarding claim 100, the combination of references teaches that said detecting said second data step includes accepting said second data using a linking device (reference numeral 42 in Figure 5 of Schwemmer), directing said second data to a second focusing element (reference numeral 40 in Figure 5 of Schwemmer) and with the output of said second focusing element being in communication with said second detector unit (see Figure 4 of Schwemmer).

Regarding claim 122, the combination of references teaches that said holographic unit includes at least one of the following: a volume hologram, a holographic mirror and a passive element (reference numeral 1 in Figure 3 of Schwemmer).

Regarding claim 123, it would have been obvious to one skilled in the art to have modulated data onto first and second light beams to be transmitted and received in an optical communication system.

Regarding claims 124 and 126 the combination of references and Schwemmer in particular teaches that a first linking device corresponds to the first detector (reference numeral 31 in Figure 4) and a second linking device corresponds to the second detector (reference numeral 30 in Figure 4), wherein the first and second linking devices are in different spatial locations (different location on element 1 as shown in Figure 4), wherein the first data detecting step comprises: redirecting, with the first linking device, said first data from a first optical path to a transversely oriented second optical path, the second optical path intersecting the first detector unit; and wherein said second data detecting step comprises: redirecting, with the second linking device, said second data from a third optical path to a transversely oriented fourth optical path, the fourth optical path intersecting the second detector unit (see Figures 4 and 5 of Schwemmer).

Regarding claim 125, the combination of references differs from the claimed invention in that it fails to specifically teach that channels are separated by about 4 nanometers. However, one skilled in the art would clearly have recognized the ability to place the wavelength as close or as far apart as necessary. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to place the wavelength about 4 nanometers apart.

3. Claims 102 and 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwemmer (U.S. Patent Number 5,255,065).

Claim 102 recites limitations similar to those of claims 92 above. Therefore, claim 102 is rejected for the same reasons as those stated regarding claim 92 above.

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Regarding Claim 106, Schwemmer teaches an apparatus, as claimed in Claim 101, wherein said detector assembly includes a linking device (reference numeral 1 in Figure 4) that accepts said first data associated with a focal spot. Schwemmer differs from the claimed invention in that Schwemmer fails to specifically teach that the accepted focal spot diameter size is greater than 50 microns. However, focal spot diameters greater than 50 microns are not uncommon in the field of free space optical communication and in fact are well known in the art (see discussion regarding claim 1 and 3 above). One skilled in the art would clearly have recognized that the device of Schwemmer clearly illustrates that the focusing element of Schwemmer is capable of reducing the spot size of a received signal. It would have been well within the realm of knowledge of one skilled in the art to have applied the teachings of Schwemmer to an optical signal that produced a focal spot size with a diameter greater than 50 microns for the express purpose of reducing the focal spot size of that received signal. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the teachings of Schwemmer to an optical signal that produced a spot size diameter greater than 50 microns in order to reduce the spot size of the signal.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 101, 103-105, 107, and 108 are rejected under 35 U.S.C. 102(b) as being anticipated by Schwemmer (U.S. Patent Number 5,255,065).

Regarding Claim 101, Schwemmer teaches an apparatus for receiving high frequency data associated with a first wavelength (see Figure 4), comprising a holographic unit that receives said data (reference numeral 1 in Figure 4), and a detector assembly responsive to said holographic unit (reference numeral 7-9, 14 in Figure 3 and 34 in Figure 4) for detecting said data, said detector assembly including a focusing element having a refractive index that reduces a focal spot size associated with said data (see Figure 4 and 5), wherein the focusing element is in direct physical contact with the detector unit (e.g. the focusing element is part of the detector unit).

Regarding Claim 103, Schwemmer teaches an apparatus, as claimed in Claim 12, wherein: said detector assembly includes a linking device (reference numeral 7 in Figure 3) and a detector unit (reference numeral 14 in Figure 3) and with said focusing element (reference numeral 8 in Figure 3) being disposed between said linking device and said detector unit, with said focusing element receiving an input from said linking device and providing an output to said detector unit.

Regarding Claim 104, Schwemmer teaches an apparatus, as claimed in Claim 12, wherein: said detector assembly includes a detector unit (reference numeral 14 in Figure 3) positioned at a distance from a focal area provided by said holographic unit and being associated with said data having said first wavelength (see Figure 4).

Regarding Claim 105, Schwemmer teaches an apparatus, as claimed in Claim 12, wherein: said detector assembly includes a sorter block (see Figure 4) for accepting said data and for providing a communication path (reference numerals 28 and 34 in Figure 4) for said first data

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from said sorter block and a spatially offset second communication path for said second data (as seen in Figure 4).

Regarding Claim 107, Schwemmer teaches an apparatus, as claimed in Claim 12, wherein: said linking device includes a pick-off mirror (reference numeral 8 in Figure 3), with said pick-off mirror being able to properly reflect a focal spot size greater than 200 microns.

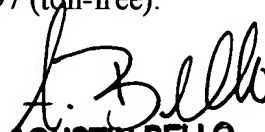
Regarding Claims 108, Schwemmer teaches an apparatus, as claimed in Claim 12, wherein: said holographic unit includes at least one of the following: a volume hologram, a holographic mirror and a passive element (reference numeral 1 in Figure 3).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


AGUSTIN BELLO
PATENT EXAMINER